NAZARBAYEV UNIVERSITY

SCHOOL OF MEDICINE

HEALTH STRATEGIES FOR RESILIENCE BUILDING FOR CLIMATE-STRESSED ARAL SEA COMMUNITIES

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Introduction

The **Aral Sea disaster** is one of the most severe cases of **climate vulnerability** and **environmental degradation** in modern history. Once the world's **fourth-largest inland sea**, it has nearly vanished due to **unsustainable water management**, leading to:

● **Desertification** and altered **microclimates**
● **Toxic dust storms** from the exposed seabed
● Declining **air and water quality**
● Major **public health impacts** across **Central Asia**

Despite these threats, **climate adaptation** and **health resilience** remain poorly integrated into **regional governance**, leaving communities **highly vulnerable**.

August 12, 2003 — August 16, 2009 : Aral Sea Region

Methods

| Data collection | • Scientific literature
• Grey literature
• Policy review |
Analysis	• Mixed methods
Synthesis	• Mixed methods
Strategy Development	• Planetary Health Framework

10 Evidence-Based Strategies

Data Analysis

Specific Techniques
Comparative Analysis: Aligning **policies** across countries
Thematic Synthesis: Identifying recurring **challenges** and **solutions**
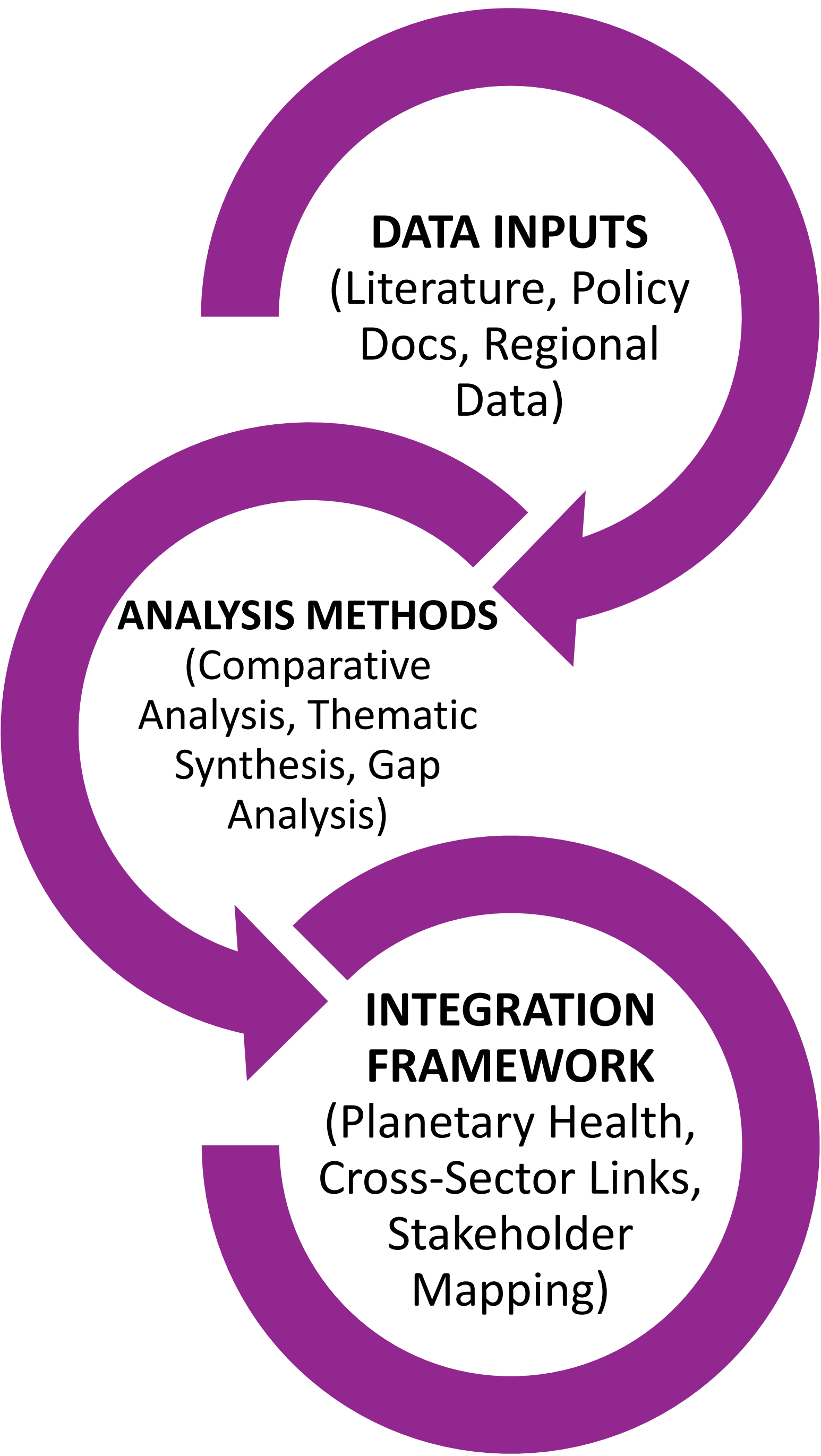*Gap Analysis*: Linking **healthcare vulnerabilities** with **environmental threats**
Stakeholder Mapping: Defining **institutional roles** in **resilience building**

Integration Process
Environmental data ↔ Health outcomes
Policy provisions ↔ Implementation gaps
Local evidence ↔ International best practices

DATA INPUTS (Literature, Policy Docs, Regional Data)

ANALYSIS METHODS (Comparative Analysis, Thematic Synthesis, Gap Analysis)

INTEGRATION FRAMEWORK (Planetary Health, Cross-Sector Links, Stakeholder Mapping)

Anticipated Results

Our analysis so far reveals that the Aral Sea crisis has given rise to a **omplex web** of **interconnected health** and **environmental challenges**.
⚠ **Fragmented approaches** are failing to deliver sustainable outcomes.
The evidence highlights an urgent need for **integrated, cross-sectoral strategies** that address the **root causes** of vulnerability.
● The following **10 practices** outline a **holistic roadmap** to **build resilience**, **protect health**, and **restore ecosystems** across the region.

10 Evidence-Based Strategies for Resilience:

1.**Expand Climate-Resilient WASH Services** — Provide sustainable **water, sanitation,** and **hygiene** systems for **vulnerable communities.**	6. **Implement Multi-Sectoral Development Programs** — Integrate health, environmental, and social security into cross-border actions.
2. **Train Healthcare Workers in Climate Adaptation** — Build skills in **infection prevention**, **nutrition counseling**, and **GBV response**.	7. **Strengthen Climate-Resilient Agriculture** — Promote **modern farming**, **soil improvement**, and **better seed varieties**.
3. **Promote Drought-Resistant Crops** — Scale up **climate-tolerant crops** such as **upland rice**.	8. **Expand School-Based Nutrition Interventions** — Provide **micronutrient supplements** and **nutrition programs** for children.
4. **Support Afforestation Initiatives** — **Plant trees** to stabilize **soil** and reduce **toxic dust storms**.	9. **Establish Environmental Health Monitoring Systems** — Track **dust storms**, **water quality**, and other **climate-health indicators**.
5. **Empower Communities through Climate Education** — Conduct **awareness** and **skill-building programs** on **adaptation techniques**.	10. **Foster Social Capital & Community Networks** — Support **women's organizations** and **local groups** to enhance **mental health** and **resilience**.

Conclusions

The **Aral Sea crisis** demands a unified Planetary Health approach — isolated solutions have proven insufficient to protect communities and ecosystems.

Looking Forward :
✓ **Implement** the 10 **integrated resilience strategies**
✓ **Prioritize cross-border cooperation** and shared governance
✓ **Mainstream resilience** across all **health and environmental policies**

✅ **Only coordinated action** can ensure a **healthy and sustainable future** for the region.

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